7/7/04

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the above-captioned application:

Listing of Claims:

1.–100. (canceled)

1 ~~101.~~ (currently amended) A method of making a polymer nanocomposite comprising:

combining a polymer dispersion with a clay mineral dispersion to form a clay-polymer dispersion, wherein the polymer dispersion comprises a negatively charged polymer, and wherein the clay-polymer dispersion comprises less than 90% by weight of clay with respect to the weight of polymer in the clay-polymer dispersion; and

adding a flocculating agent to the clay-polymer dispersion mixture to form the polymer nanocomposite, wherein the flocculating agent comprises a positively charged compound.

2 ~~102.~~ (previously presented) The method of claim 101, wherein the polymer dispersion comprises less than 80% by weight of the negatively charged polymer.

3 ~~103.~~ (previously presented) The method of claim 101, wherein the negatively charged polymer comprises styrene-butadiene latex.

4 ~~104.~~ (previously presented) The method of claim 101, wherein the negatively charged polymer comprises latex.

105. (previously presented) The method of claim 101, wherein the clay mineral dispersion comprises montmorillonite.

106. (previously presented) The method of claim 101, wherein the clay mineral dispersion comprises bentonite.

107. (previously presented) The method of claim 101, wherein the clay mineral dispersion comprises hectorite, saponite, attapulgite, beidellite, stevensite, sauconite, nontronite, Laponite, or sepiolite.

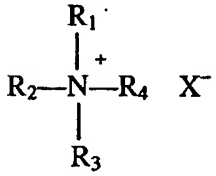
108. (currently amended) The method of claim 101, wherein the clay mineral dispersion comprises from about 1% to about 10% by weight of the clay mineral.

109. (previously presented) The method of claim 101, further comprising forming the clay mineral dispersion by subjecting a mixture of the clay mineral in a liquid carrier to a high shear process.

110. (previously presented) The method of claim 101, wherein the clay-polymer dispersion comprises less than 30% by weight of clay mineral with respect to the weight of the negatively charged polymer in the clay-polymer dispersion.

111. (previously presented) The method of claim 101, wherein the flocculating agent comprises a quaternary ammonium compound.

112. (previously presented) The method of claim 101, wherein the flocculating agent comprises a quaternary ammonium compound having the structure:



wherein R_1, R_2, R_3, and R_4 are independently alkyl groups, aryl groups or arylalkyl groups, and wherein at least one of R_1, R_2, R_3, or R_4 is an aliphatic group derived from a naturally occurring oil.

113. (previously presented) The method of claim 101, wherein the flocculating agent comprises between about 1% to about 10% by weight of the clay-polymer dispersion.

114. (previously presented) The method of claim 101, wherein the flocculating agent comprises hydrotalcite.

115. (previously presented) The method of claim 101, wherein the clay mineral dispersion comprises montmorillonite and wherein the flocculating agent comprises hydrotalcite.

116. (currently amended) A polymer nanocomposite made by the method comprising:

combining a polymer dispersion with a clay mineral dispersion to form a clay-polymer dispersion, wherein the polymer dispersion comprises a negatively charged polymer, and wherein the clay-polymer dispersion comprises less than 90% by weight of clay with respect to the weight of polymer in the clay-polymer dispersion; and

adding a flocculating agent to the clay-polymer dispersion mixture to form the polymer nanocomposite, wherein the flocculating agent comprises a positively charged compound.

117. (previously presented) The polymer nanocomposite of claim 116, wherein the polymer dispersion comprises less than 80% by weight of the negatively charged polymer.

118. (previously presented) The polymer nanocomposite of claim 116, wherein the negatively charged polymer comprises styrene-butadiene latex.

19 119. (previously presented) The polymer nanocomposite of claim 116, wherein the negatively charged polymer comprises latex.

20 120. (previously presented) The polymer nanocomposite of claim 116, wherein the clay mineral dispersion comprises montmorillonite.

21 121. (previously presented) The polymer nanocomposite of claim 116, wherein the clay mineral dispersion comprises bentonite.

22 122. (previously presented) The polymer nanocomposite of claim 116, wherein the clay mineral dispersion comprises hectorite, saponite, attapulgite, beidellite, stevensite, sauconite, nontronite, Laponite, or sepiolite.

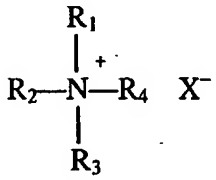
23 123. (currently amended) The polymer nanocomposite of claim 116, wherein the clay mineral dispersion comprises from about 1% to about 10% by weight of the clay mineral.

24 124. (previously presented) The polymer nanocomposite of claim 116, wherein the method further comprises forming the clay mineral dispersion by subjecting a mixture of the clay mineral in a liquid carrier to a high shear process.

25 125. (previously presented) The polymer nanocomposite of claim 116, wherein the clay-polymer dispersion comprises less than 30% by weight of clay mineral with respect to the weight of the negatively charged polymer in the clay-polymer dispersion.

26 126. (previously presented) The polymer nanocomposite of claim 116, wherein the flocculating agent comprises a quaternary ammonium compound.

127. (previously presented) The polymer nanocomposite of claim 116, wherein the flocculating agent comprises a quaternary ammonium compound having the structure:



wherein R_1, R_2, R_3, and R_4 are independently alkyl groups, aryl groups or arylalkyl groups, and wherein at least one of R_1, R_2, R_3, or R_4 is an aliphatic group derived from a naturally occurring oil.

128. (previously presented) The polymer nanocomposite of claim 116, wherein the flocculating agent comprises between about 1% to about 10% by weight of the clay-polymer dispersion.

129. (previously presented) The polymer nanocomposite of claim 116, wherein the flocculating agent comprises hydrotalcite.

130. (previously presented) The polymer nanocomposite of claim 116, wherein the mineral clay mineral dispersion comprises montmorillonite and wherein the flocculating agent comprises hydrotalcite.

131. (previously presented) A method of making a polymer nanocomposite comprising:

combining a polymer dispersion with a clay mineral dispersion to form a clay-polymer dispersion; wherein the clay-polymer dispersion comprises less than 90% by weight of clay mineral with respect to the weight of the polymer in the clay-polymer dispersion; and

adding a flocculating agent to the clay-polymer dispersion mixture to form the polymer nanocomposite.

132. (previously presented) The method of claim 131, wherein the polymer dispersion comprises latex.

133. (previously presented) The method of claim 131, wherein the polymer dispersion comprises polyvinyl chloride, a chlorosulfonated polyethylene rubber, a fluoroeleastomer, or polyisoprene.

134. (previously presented) The method of claim 131, wherein the polymer dispersion comprises less than 80% by weight of the polymer.

135. (previously presented) The method of claim 131, wherein the clay mineral dispersion comprises montmorillonite.

136. (previously presented) The method of claim 131, wherein the clay mineral dispersion comprises bentonite.

137. (previously presented) The method of claim 131, wherein the clay mineral dispersion comprises hectorite, saponite, attapulgite, beidellite, stevensite, sauconite, nontronite, Laponite, or sepiolite.

138. (previously presented) The method of claim 131, wherein the clay mineral dispersion comprises hydrotalcite.

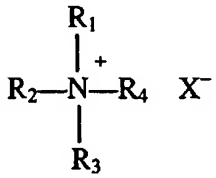
139. (currently amended) The method of claim 131, wherein the clay mineral dispersion comprises from about 1% to about 10% by weight of the clay mineral.

140. (previously presented) The method of claim 131, further comprising forming the clay mineral dispersion by subjecting a mixture of the clay mineral in a liquid carrier to a high shear process.

141. (previously presented) The method of claim 131, wherein the clay-polymer dispersion comprises less than 30% by weight of clay mineral with respect to the weight of polymer in the clay-polymer dispersion.

142. (previously presented) The method of claim 131, wherein the flocculating agent comprises a quaternary ammonium compound.

143. (previously presented) The method of claim 131, wherein the flocculating agent comprises a quaternary ammonium compound having the structure:



wherein R_1, R_2, R_3, and R_4 are independently alkyl groups, aryl groups or arylalkyl groups, and wherein at least one of R_1, R_2, R_3, or R_4 is an aliphatic group derived from a naturally occurring oil.

144. (previously presented) The method of claim 131, wherein the flocculating agent comprises between about 1% to about 10% by weight of the clay-polymer dispersion.

145. (previously presented) The method of claim 131, wherein the flocculating agent comprises hydrotalcite.

146. (previously presented) A polymer nanocomposite made by a method comprising:

combining a polymer dispersion with a clay mineral dispersion to form a clay-polymer

dispersion; wherein the clay-polymer dispersion comprises less than 90% by weight of clay mineral with respect to the weight of the polymer in the clay-polymer dispersion; and

adding a flocculating agent to the clay-polymer dispersion mixture to form the polymer nanocomposite.

147. (previously presented) The polymer nanocomposite of claim 146, wherein the polymer dispersion comprises latex.

148. (previously presented) The polymer nanocomposite of claim 146, wherein the polymer dispersion comprises polyvinyl chloride, a chlorosulfonated polyethylene rubber, a fluoroeleastomer, or polyisoprene.

149. (previously presented) The polymer nanocomposite of claim 146, wherein the polymer dispersion comprises less than 80% by weight of the polymer.

150. (previously presented) The polymer nanocomposite of claim 146, wherein the clay mineral dispersion comprises montmorillonite.

151. (previously presented) The polymer nanocomposite of claim 146, wherein the clay mineral dispersion comprises bentonite.

152. (previously presented) The polymer nanocomposite of claim 146, wherein the clay mineral dispersion comprises hectorite, saponite, attapulgite, beidellite, stevensite, sauconite, nontronite, Laponite, or sepiolite.

153. (previously presented) The polymer nanocomposite of claim 146, wherein the clay mineral dispersion comprises hydrotalcite.

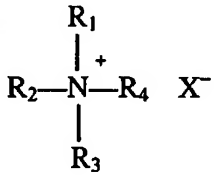
154. (currently amended) The polymer nanocomposite of claim 146, wherein the clay mineral dispersion comprises from about 1% to about 10% by weight of the clay mineral.

155. (previously presented) The polymer nanocomposite of claim 146, further comprising forming the clay mineral dispersion by subjecting a mixture of the clay mineral in a liquid carrier to a high shear process.

156. (previously presented) The polymer nanocomposite of claim 146, wherein the clay-polymer dispersion comprises less than 30% by weight of clay mineral with respect to the weight of polymer in the clay-polymer dispersion.

157. (previously presented) The polymer nanocomposite of claim 146, wherein the flocculating agent comprises a quaternary ammonium compound.

158. (previously presented) The polymer nanocomposite of claim 146, wherein the flocculating agent comprises a quaternary ammonium compound having the structure:



wherein R_1, R_2, R_3, and R_4 are independently alkyl groups, aryl groups or arylalkyl groups, and wherein at least one of R_1, R_2, R_3, or R_4 is an aliphatic group derived from a naturally occurring oil.

159. (previously presented) The polymer nanocomposite of claim 146, wherein the flocculating agent comprises between about 1% to about 10% by weight of the clay-polymer dispersion.

160. (previously presented) The polymer nanocomposite of claim 146, wherein the flocculating agent comprises hydrotalcite.